

NOTES: UNLESS OTHERWISE SPECIFIED

1. THE AR AND HR 809 nm COATINGS SHALL BE MULTILAYER DIELECTRIC SUCH THAT THE 8-BOUNCE ZIG-ZAG PATH OF 1064 NM LIGHT TRAVELING THROUGH THE CENTER WILL NOT SUFFER FROM TOTAL SINGLE-PASS LOSSES OF MORE THAN 4% TO BE MEASURED AT NASA-GSFC. THESE COATINGS SHALL BE 0.5 mm MAX FROM THE BREWSTER FACES.

2. THE HR COATING ON THE LONG REAR FACE SHALL PRODUCE TIR WHEN AN ADHESIVE IS APPLIED TO THAT SURFACE.

3. BREWSTER FACES TO BE PARALLEL WITHIN 30 ARC SECONDS.

4. WAVEFRONT DISTORTION SHALL BE LESS THAN 1.0 WAVE OVER THE ZIG-ZAG OPTICAL PATH LENGTH AT 632 NM FOR THE TOTAL CLEAR APERTURE.

5. SURFACE FIGURE AND QUALITY:
BREWSTER FACES: $\lambda/10$ AND 10/5 SCRATCH/DIG.
TIR FACES: $\lambda/10$ PER ANY 1 cm LENGTH,
20/10 SCRATCH/DIG.

6. CHAMFER: GROUND, NOT POLISHED
WIDTH: 0.15 mm ± 0.075 ALONG LENGTH,
0.10 mm ± 0.075 END FACES.
ANGLE IS 45 ± 5 .

7. Nd YAG INDEX: $N(y) = 1.819 \pm 0.001$

FACE LENGTH: L

NUMBER OF BOUNCES: N = 8

INCIDENT ANGLE: θ_{inc}

REFRACTIVE ANGLE: θ_r

TIR BOUNCE ANGLE: θ_n

BREWSTER TIP ANGLE: $\theta_c = 29.0^\circ \pm 0.02^\circ$

8. MEASURE BREWSTER FACE ANGLE AND THICKNESS OF FINAL POLISHED FACES A AND B. USE THE MEASURED PARAMETERS TO DETERMINE L.

9. FOR ZERO TOLERANCE VALUES:

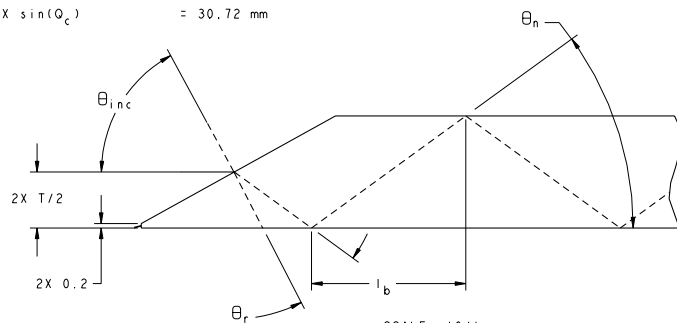
$$\theta_n = \theta_{inc} - \theta_r = 32.26 \text{ deg}$$

$$l_b = T / (\tan \theta_n) = 7.921 \text{ mm}$$

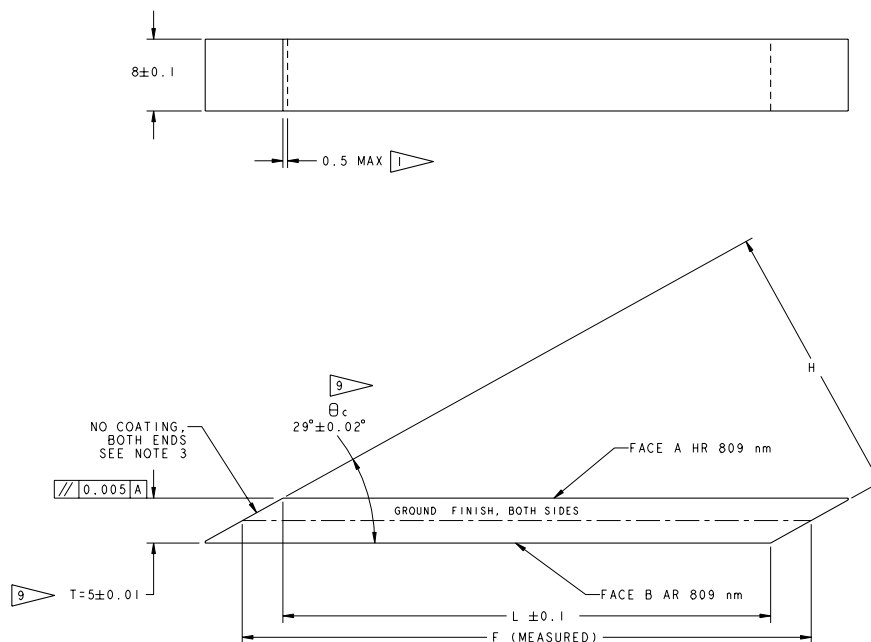
$$L = (N \times l_b) - T / \tan \theta_c = 54.35 \text{ mm}$$

$$F = N \times l_b = 63.368 \text{ mm}$$

$$H = F \times \sin(\theta_c) = 30.72 \text{ mm}$$



10. The center 2 mm will be essentially defect-free along the complete length of the slab on both the HR and AR surfaces. Some defects are allowable along or near the edges. (severity of defects TBD upon inspection)



ALL DIMENSIONS ARE IN MILLIMETERS

REVISION				DATE		APPROVAL	
ITEM	NO.	DESCRIPTION	DATE	DATE	DATE	DATE	DATE
LIST OF MATERIAL							
Goddard Space Flight Center				Greenbelt, Maryland			
DRAWING INTERPRETED PER GSFC-1073-64-1				THEO-75			
SLAB 8 mm WIDE				8 bounce			
GD				SK498-2			
CODE: 920				SCALE: 4/1			
WEIGHT:				SHEET: 1 OF 1			

THIS DRAWING WAS PRODUCED USING
SOFTWARE: Pro/ENGINEER VERSION: WF2
FILE NAME: SK497 REV -1.2
MODEL NAME: SK497 REV -1.8

ITEM NO. PART NO. DESCRIPTION
GCSK1070 THEO
GCSK1770 LRR
NEXT ASSEMBLY USED ON

APPROVED BY: D COYLE
APPROVED BY: D COYLE
APPROVED BY: D COYLE
APPROVED BY: D COYLE

APPROVED BY: D COYLE
APPROVED BY: D COYLE
APPROVED BY: D COYLE
APPROVED BY: D COYLE

REV	DATE	DESCRIPTION	APPROVAL
1			

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2. THE HR COATING ON THE LONG REAR FACE SHALL PRODUCE TIR WHEN AN ADHESIVE IS APPLIED TO THAT SURFACE.

3. BREWSTER FACES TO BE PARALLEL WITHIN 30 ARC SECONDS.

4. WAVEFRONT DISTORTION SHALL BE LESS THAN 1.0 WAVE OVER THE ZIG-ZAG OPTICAL PATH LENGTH AT 632 NM FOR THE TOTAL CLEAR APERTURE.

5. SURFACE FIGURE AND QUALITY:
BREWSTER FACES: LAMBDA/10 AND 10/5 SCRATCH/DIG.
TIR FACES: LAMBDA/10 PER ANY 1 cm LENGTH,
20/10 SCRATCH/DIG.

6. CHAMFER: GROUND, NOT POLISHED.
WIDTH: 0.15 mm \pm 0.075 ALONG LENGTH.
0.10 mm \pm 0.075 END FACES.
ANGLE IS 45 \pm 5.

7. Nd YAG INDEX: $N(y) = 1.819 \pm 0.001$

FACE LENGTH: L

NUMBER OF BOUNCES: N = 8

INCIDENT ANGLE: θ_{inc}

REFRACTIVE ANGLE: θ_r

TIR BOUNCE ANGLE: θ_n

BREWSTER TIP ANGLE: $\theta_c = 28^\circ \pm 0.02^\circ$

8. MEASURE BREWSTER FACE ANGLE AND THICKNESS OF FINAL POLISHED FACES A AND B. USE THE MEASURED PARAMETERS TO DETERMINE L.

9. FOR ZERO TOLERANCE VALUES:

$$\theta_n = \theta_{inc} - \theta_r = 32.96 \text{ deg}$$

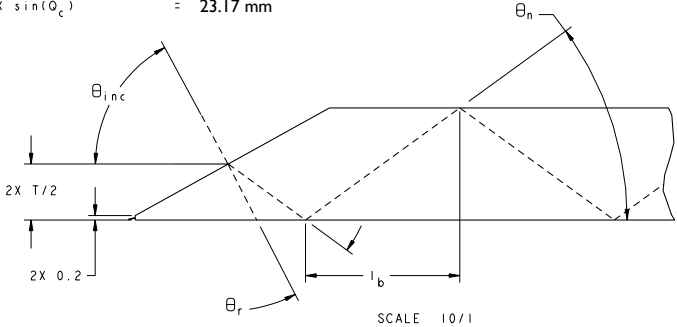
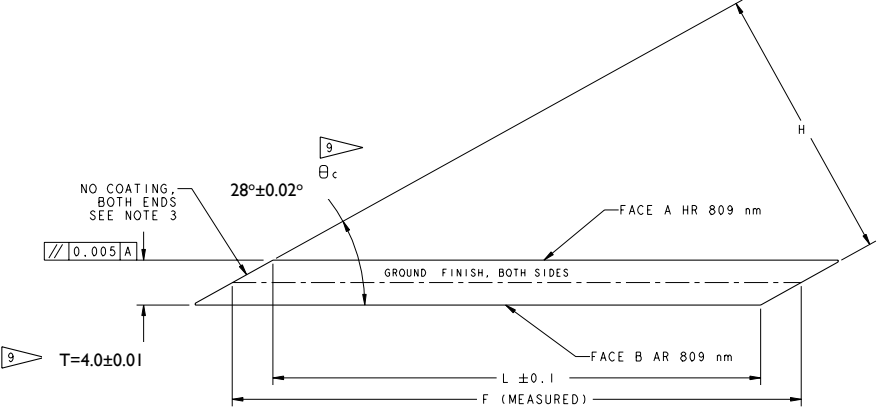
$$l_b = T / (\tan \theta_n) = 6.169 \text{ mm}$$

$$L = (N \times l_b) - T / \tan \theta_c = 41.82 \text{ mm}$$

$$F = N \times l_b = 49.35 \text{ mm}$$

$$H = F \times \sin(\theta_c) = 23.17 \text{ mm}$$

10. The center 2 mm will be essentially defect-free along the complete length of the slab on both the HR and AR surfaces. Some defects are allowable along or near the edges. (severity of defects TBD upon inspection)



ALL DIMENSIONS ARE IN MILLIMETERS

ITEM NO.	REQD	PART NO.	DESCRIPTION	Nd YAG	MATERIAL	MATERIAL SPEC & NO.
LIST OF MATERIAL						
Goddard Space Flight Center						
Greenbelt, Maryland						
DRAWING INTERPRETED PER GSFC-603-64-1						
THEO-50						
SLAB 5 mm WIDE						
8 bounce						
GD SK498-3						
CODE: 920 SCALE: 4/1 WEIGHT: SHEET: 1 OF 1						

THIS DRAWING WAS PRODUCED USING
SOFTWARE: PLOTENGINEER VERSION: WF2
FILE NAME: SK497 REV -2
MODEL NAME: SK497 REV -8

GCSK1070 TheO
GCSK770 LRR
NEXT ASSEMBLY USED ON

APPROVED
D COYLE
APPROVED-DESIGNER

GD SK497